AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Previously Presented) An optical fibre having a longitudinal, optical axis, and a cross section perpendicular to the longitudinal axis, the optical fibre being adapted to guide light at an operating wavelength λ, the optical fibre comprising:

a. a first core region disposed around the longitudinal, optical axis, the first core region exhibiting a predetermined refractive index profile n_{core-1};

b. a second core region surrounding the first core region, the second core region exhibiting a predetermined refractive index profile n_{core-2};

c. a cladding region surrounding the second core region and comprising a multitude of longitudinally extending spaced apart micro-structural holes disposed in a cladding material, the cladding material having a refractive index n_{clad}, the holes having cross sectional dimensions $d_i(z)$ and mutual centre to centre distances $\Lambda_{ij}(z)$, z being a coordinate along the longitudinal axis of the optical fibre;

d. a first fibre cross section having a first cross sectional area;

e. a second fibre cross section having a second cross sectional area which is smaller than the first cross sectional area;

f. the first and second fibre cross sections being separated by a tapered length of the optical fibre over which the cross-sectional physical

dimensions of the fibre, including the micro-structural holes, are tapered down from the first to the second cross section; and

wherein in the first and second cross sectional areas, the refractive index profiles n_{core-1}, n_{core-2} of the first and second core regions, the refractive index n_{clad} of the cladding region and the cross sectional dimensions d_i and mutual centre to centre distances Λ_{ij} of the micro-structural holes in the first and second cross sectional areas are adapted, at the operating wavelength, to provide a mode field of a guided mode of the optical fibre with a diameter MFD_1 in the first cross section, and a mode field with a diameter MFD_2 in the second cross section, and wherein MFD_2 is larger than or equal to MFD_1.

2. (Previously Presented) An optical fibre according to claim 1 wherein the micro-structural holes are arranged in a substantially periodic pattern when viewed in a cross section of the optical fibre perpendicular to the longitudinal axis, the periodicity being defined by the location of the centres of the micro-structural holes.

3. (Previously Presented) An optical fibre according to claim 1 wherein in the second fibre cross section, the cross sectional dimensions of at least innermost holes of the cladding region are larger than zero.

4. (Previously Presented) An optical fibre according to claim 3 wherein at least the innermost holes have substantially similar ratio of cross sectional dimension to mutual centre to centre distance d/Λ at the first and second fibre cross sections.

5. (Cancelled)

6. (Previously Presented) An optical fibre according to claim 1, further comprising an intermediate region surrounding the first core region and being surrounded by the second core region.

7. (Original) An optical fibre according to claim 6 wherein the intermediate region is disposed adjacent to the first and second core regions.

8. (Previously Presented) An optical fibre according to claim 6 wherein the intermediate region exhibits a predetermined refractive index profile n_{ir} and wherein $n_{ir} < n_{core-1}$ and $n_{ir} < n_{core-2}$.

9. (Previously Presented) An optical fibre according to claim 6 wherein the geometrically averaged refractive index $n_{g,core-1,ir}$ of the first core and intermediate regions is substantially equal to the refractive index n_{core-2} of the second core region.

10. (Cancelled).

11. (Previously Presented) An optical fibre according to claim 1 wherein the refractive index profile of the first core region is a step-index-profile with an index-step Δn_1 down to the refractive index n_{core-2} of the second core region.

12. (Cancelled).

13. (Previously Presented) An optical fibre according to claim 1 wherein the refractive index profile of the first core region is a step-index-profile with an index-step $\Delta n_{1\text{-clad}}$ down to the refractive index of the cladding material n_{clad}.

14. (Cancelled).

15. (Previously Presented) An optical fibre according to claim 13 wherein Δn_1 is identical to $\Delta_{n1\text{-clad}}$.

16. (Previously Presented) An optical fibre according to claim 6 wherein the refractive index profile of the intermediate region is a step-index-profile with an index-step Δn_2 up to the refractive index $n_{core\text{-}2}$ of the second core region.

17. (Cancelled).

18. (Previously Presented) An optical fibre according to claim 6 wherein the refractive index profile of the intermediate region is a step-index-profile with an index-step $\Delta n_{2\text{-clad}}$ up to the refractive index of the cladding material n_{clad}.

19. (Cancelled).

20. (Previously Presented) An optical fibre according to claim 6 wherein the refractive index profile of the second core region is a step-index-profile with an index-step Δn_3 down to the refractive index of the surrounding cladding region.

21 - 24 (Cancelled).

25. (Previously Presented) An optical fibre according to claim 1 wherein

a. the first core region has a numerical aperture NA_{core-1} and a cross-sectional dimension $d_{1,core-1}$ in said first fibre cross section, and a cross-sectional dimension $d_{2,core-1}$ in said second fibre cross section;

b. the second core region has a refractive index n_{core-2}, a numerical aperture NA_{core-2} in said second fibre cross section, a cross-sectional dimension $d_{1,core-2}$ in said first cross section, and a cross-sectional dimension $d_{2,core-2}$ in said second fibre cross section;

c. an outer cladding region surrounding said second core region, said outer cladding region having a refractive index $n_{1,clad}$ or effective refractive index $n_{1,eff,clad}$ in said first fibre cross section and $n_{2,clad}$ or $n_{2,eff,clad}$ in said second fibre cross section;

d. $n_{core-1} > n_{core-2}$;

e. $n_{1,clad} < n_{core-2} < 1.002*n_{1,clad}$; or $n_{1,eff,clad} < n_{core-2} < 1.002*n_{1,eff,clad}$;

f. $d_{1,core-1} > 1.3*d_{2,core-1}$

g. $d_{2,core-2}$ is larger than or equal to $d_{1,core-1}$;

h. $2\pi/\lambda*d_{1,core-1}/2*NA_{core-1}$ is less than 4;

i. $2\pi/\lambda*d_{2,core-1}/2*NA_{core-1}$ is less than 2;

j. $2\pi/\lambda*d_{2,core-2}/2*NA_{core-2}$ is less than 4.

26 - 34 (Cancelled).

35. (Previously Presented) An optical fibre for guiding light at a predetermined wavelength, λ, and having a longitudinal, optical axis, comprising:

b. a first core region disposed around said longitudinal, optical axis having a refractive index n_{core-1}, a numerical aperture NA_{core-1}, and dimension $d_{1,core-1}$;

c. a second core region surrounding said first core region, said second core region having a refractive index n_{core-2}, and dimension $d_{1,core-2}$;

d. an outer cladding surrounding said second core region, said outer cladding having a refractive index $n_{1,clad}$ or effective refractive index $n_{1,eff,clad}$;

e. $n_{core-1} > n_{core-2}$;

f. $2\pi/\lambda * d_{1,core-1}/2 * NA_{core-1}$ in the range from 1.5 to 4;

g. $2\pi/\lambda * d_{1,core-2}/2 * NA_{core-2}$ in the range from 2.0 to 28.

36 - 42 (Cancelled).

43. (Previously Presented) An article comprising a photonic crystal fibre according to claim 1.

44. (Original) An article according to claim 43 wherein the article is a coupler.

45. (Original) An article according to claim 43 wherein the article is a fibre amplifier or fibre laser.

46 - 106 (Cancelled).

107. (Previously Presented) An optical fiber according to claim 1, wherein the operating wavelength is within the range of 150 nm to 11 μm.

108. (Previously Presented) An optical fiber according to claim 107, wherein the operating wavelength is 1.06 μm

109. -110. (Cancelled)

111. (Previously Presented) An optical fiber according to claim 1, wherein the operating wavelength is within the range of 150 nm to 11 μm.

112. (Previously Presented) An optical fiber according to claim 107, wherein the operating wavelength is 1.06 μm.

113. (New) An optical fibre having a longitudinal, optical axis, and a cross section perpendicular to the longitudinal axis, the optical fibre being adapted to guide light at an operating wavelength λ, the optical fibre comprising:

a. a first core region disposed around the longitudinal, optical axis, the first core region exhibiting a predetermined refractive index profile n_{core-1}, a numerical aperture NA_{core-1} and a cross-sectional dimension $d_{1,core-1}$ in said first fibre cross section, and a cross-sectional dimension $d_{2,core-1}$ in said second fibre cross section ;

b. a second core region surrounding the first core region, the second core region exhibiting a predetermined refractive index profile n_{core-2};

c. cladding region surrounding the second core region, the cladding region having a refractive index n_{clad};

d. a first fibre cross section having a first cross sectional area;

e. a second fibre cross section having a second cross sectional area which is smaller than the first cross sectional area;

f. the first and second fibre cross sections being separated by a tapered length of the optical fibre over which the cross-sectional physical dimensions of the optical fibre are tapered down from the first to the second cross section; and

wherein in the first and second cross sectional areas, the refractive index profiles of the first and second core regions and the refractive index n_{clad} of the cladding region are adapted, at the operating wavelength, to provide a mode field of a guided mode of the optical fibre with a diameter MFD_1 in the first cross section, and a mode field with a diameter MFD_2 in the second cross section, and wherein MFD_2 is larger than or equal to MFD_1, and wherein said optical fiber further comprises an intermediate region surrounding the first core region and being surrounded by the second core region.

114. (New) An optical fibre according to claim 113, wherein the refractive index profile of the first core region is a step-index-profile with an index-step Δn_1 down to the refractive index n_{core-2} of the second core region.

115. (New) An optical fibre according to claim 113, wherein the refractive index profile of the first core region is a step-index-profile with an index-step $\Delta n_{1\text{-clad}}$ down to the refractive index $n_{core\text{-}2}$ of the cladding material n_{clad}.

116. (New) An article comprising a photonic crystal fibre according to claim 113.

117. (New) An article according to claim 116, wherein the article is a coupler.

118. (New) An article according to claim 116, wherein the article is a fibre amplifier or fiber laser.

119. (New) An optical fiber according to claim 113, wherein the operating wavelength is within the range of 150 nm to 11 μm.

120. (New) An optical fiber according to claim 119, wherein the operating wavelength is 1.06 μm.

121. (New) An optical fibre having a longitudinal, optical axis, and a cross section perpendicular to the longitudinal axis, the optical fibre being adapted to guide light at an operating wavelength λ, the optical fibre comprising:

a. a first core region disposed around the longitudinal, optical axis, the first core region exhibiting a predetermined refractive index profile $n_{core\text{-}1}$, a

numerical aperture NA_{core-1} and a cross-sectional dimension $d_{1,core-1}$ in said first fibre cross section, and a cross-sectional dimension $d_{2,core-1}$ in said second fibre cross section ;

b. a second core region surrounding the first core region, the second core region exhibiting a predetermined refractive index profile n_{core-2};

c. cladding region surrounding the second core region, the cladding region having a refractive index n_{clad};

d. a first fibre cross section having a first cross sectional area;

e. a second fibre cross section having a second cross sectional area which is smaller than the first cross sectional area;

f. the first and second fibre cross sections being separated by a tapered length of the optical fibre over which the cross-sectional physical dimensions of the optical fibre are tapered down from the first to the second cross section; and

wherein in the first and second cross sectional areas, the refractive index profiles of the first and second core regions and the refractive index n_{clad} of the cladding region are adapted, at the operating wavelength, to provide a mode field of a guided mode of the optical fibre with a diameter MFD_1 in the first cross section, and a mode field with a diameter MFD_2 in the second cross section, and wherein MFD_2 is larger than or equal to MFD_1, and wherein

i. the first core region has a numerical aperture NA_{core-1} and a cross-sectional dimension $d_{1,core-1}$ in said first fibre cross section, and a cross-sectional dimension $d_{2,core-1}$ in said second fibre cross section;

ii. the second core region has a refractive index n_{core-2}, a numerical aperture NA_{core-2} in said second fibre cross section, a cross-sectional dimension $d_{1,core-2}$ in said first cross section, and a cross-sectional dimension $d_{2,core-2}$ in said second fibre cross section;

iii. an outer cladding region surrounding said second core region, said outer cladding region having a refractive index $n_{1,clad}$ or effective refractive index $n_{1,eff,clad}$ in said first fibre cross section and $n_{2,clad}$ or $n_{2,eff,clad}$ in said second fibre cross section;

iv. $n_{core-1} > n_{core-2}$;

v. $n_{1,clad} < n_{core-2} < 1.002*n_{1,clad}$; or $n_{1,eff,clad} < n_{core-2} < 1.002*n_{1,eff,clad}$;

vi. $d_{1,core-1} > 1.3*d_{2,core-1}$

vii. $d_{2,core-2}$ is larger than or equal to $d_{1,core-1}$;

viii. $2\pi/\lambda*d_{1,core-1}/2*NA_{core-1}$ is less than 4;

ix. $2\pi/\lambda*d2_{,core-1}/2*NA_{core-1}$ is less than 2;

x. $2\pi/\lambda*d_{2,core-2}/2*NA_{core-2}$ is than 4.

122. (New) An optical fibre according to claim 121, wherein the refractive index profile of the first core region is a step-index-profile with an index-step Δn_1 down to the refractive index n_{core-2} of the second core region.

123. (New) An optical fibre according to claim 121, wherein the refractive index profile of the first core region is a step-index-profile with an index-step Δn_{1-clad} down to the refractive index n_{core-2} of the cladding material n_{clad}.

124. (New) An article comprising a photonic crystal fibre according to claim 121.

125. (New) An article according to claim 124, wherein the article is a coupler.

126. (New) An article according to claim 124, wherein the article is a fibre amplifier or fiber laser.

127. (New) An optical fiber according to claim 121, wherein the operating wavelength is within the range of 150 nm to 11 μm.

128. (New) An optical fiber according to claim 127, wherein the operating wavelength is 1.06 μm.